

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-15, 18, and 19 are currently pending. Claims 1, 18, and 19 have been amended by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, Claims 1, 2, 13, 18, and 19 were rejected on the grounds of non-statutory obviousness-type double patenting as being unpatentable over Claims 1, 2, and 9 of U.S. Patent No. 6,853,673 to Fukui et al. (hereinafter “the ‘673 patent”) in view of U.S. Patent Application Publication No. 2003/0113449 to Tsuji et al. (hereinafter “the ‘449 application”).

Claim 1 has been amended to recite the step of removing one of a foreign substance located on the inside surface and a bubble located under the inside surface only by arc discharge without evacuation. Claims 18 and 19 have been amended in an analogous manner.

Applicants respectfully submit that the double-patenting rejections of Claims 1, 2, 18, and 19 are rendered moot by the present amendment to Claims 1, 2, 18, and 19.

The ‘673 patent is directed to the production process quartz class crucible including rotating a mold and forming a stable ring-like arc generated by a discharge between plural electrodes adjacent to each other. However, as admitted in the outstanding Office Action, the ‘673 patent fails to disclose the step of removing one of a foreign substance located on the inside surface and a bubble located under the inside surface, as recited in Claim 1. In particular, the ‘673 patent fails to disclose removing one of a foreign substance located on the inside surface and a bubble located under the inside surface only by arc discharge without evacuation, as recited in amended Claim 1.

The ‘449 application is directed to a composite crucible for pulling up monocrystalline silicone, comprising an interlayer made of quartz glass, and an outer layer made of a carbonaceous material. Regarding removing bubbles, the ‘449 application discloses a method “to use a gas permeable carbon crucible having an outer layer of the carbon fibers, etc., to reduce the pressure via the outer layer during heating and fusing of quartz powders and to suck gas in the quartz layer and remove off outside.”¹

However, Applicants respectfully submit that the ‘449 application fails to disclose removing one a foreign substance located on the inside surface and a bubble located under the inside surface only by arc discharge without evacuation, as recited in amended Claims 1, 18, and 19. In particular, Applicants note that the removing step recited in Claim 1 is performed without pressure reduction from the outside surface. Thus, Applicants respectfully submit that the removal process recited in Claim 1 is different from that disclosed by the ‘449 application.

Thus, no matter how the teachings of the ‘673 patent and the ‘449 application are combined, the combination does not teach or suggest removing one of a foreign substance located on the inside surface and a bubble located under the inside surface only by arc discharge without evacuation, as recited in amended Claims 1, 18, and 19. Accordingly, Applicants respectfully submit that the double-patenting rejection of those claims is rendered moot.

Independent Claim 13 recites the step of one of mechanically removing a foreign substance on an inside surface of the crucible and removing a bubble just under the inside surface of the crucible by grinding.

In contrast, the ‘449 application discloses in paragraphs [0035] and [0042] a method in which “the total quartz glass layer is removed by applying impact on the composite

¹ See ‘449 application, paragraph [0026].

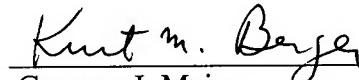
crucible." Thus, Applicants respectfully submit that the '449 application fails to disclose mechanically removing a foreign substance on an inside surface of the crucible and removing a bubble just under the inside surface of the crucible by grinding, as required by Claim 13. Accordingly, Applicants respectfully traverse the double patenting rejection of Claim 13.

Thus, it is respectfully submitted that independent Claims 1, 13, 18, and 19 patentably define over any proper combination of the '673 patent and the '449 application.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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